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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/030,342	12/28/2001	Fergus O'Brien	27795-00025	5883

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EXAMINER

STRANGE, AARON N

ART UNIT	PAPER NUMBER
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2153

DATE MAILED: 08/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/030,342	O'BRIEN ET AL.	
	Examiner	Art Unit	
	Aaron Strange	2153	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 May 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 5/22/06 have been fully considered but they are not persuasive.
2. With regard to claim 1, and Applicant's assertion that there is no motivation to combine Annapareddy and Watts (Page 5 of Remarks), the Examiner respectfully disagrees. As discussed in the Office action of 2/22/2006, selecting cross links in order to generate a small-world network will substantially reduce the average path length of the network (at least Fig 2 and discussion thereof). It would have been apparent to one of ordinary skill in the art at the time the invention was made that reducing the path length in a network would result in reduced latency and more efficient routing on the network, since the number of hops to reach a network destination (the path length) is reduced.

Obviousness can be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

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3. With further regard to claim 1, and Applicant's assertion that there is no reasonable expectation of success in combining Annapareddy and Watts (Page 6 of Remarks), the Examiner respectfully disagrees. Applicant has failed to provide any evidence in support of this assertion, and it is apparent that the cross links could be selected in order to form a small world network, as taught by Watts.

Applicant is reminded that the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In this case, the teachings of Watts would have suggested to one of ordinary skill in the art to utilize random cross links within a network such as the one disclosed by Annapareddy in order to reduce the average path length and improve performance of the network.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Annapareddy et al. (US 5,602,839) in view of Watts et al. ("Collective dynamics of 'small-world' networks").

6. With regard to claim 1, Annapareddy discloses a system comprising:
a plurality of computing nodes (Col 5, Lines 45-47)(Fig 2, n1, n2, etc)
interconnected to form a plurality of node clusters (groups),
wherein cross links are provided between said clusters (Col 5, Lines 53-59 and Fig 2). Annapareddy fails to specifically disclose selecting the cross-links such that the system comprises a small world network.

Watts discloses a small world network wherein cross-links (edges) are provided between said node clusters (Fig 1); and wherein the cross links are selected such that the system comprises a small-world network (Col 1, ¶2-4 and Fig 1); and

wherein the small-world network comprises a substantially higher clustering coefficient of nodes in combination with a substantially lower characteristic path length between the nodes in comparison with a corresponding randomly-connected network (Col 1, ¶4 and Fig 2).

This would have been an advantageous modification to the system disclosed by Annapareddy since it would have significantly reduced the average path length, resulting in reduced latency and more efficient routing on the network, since the average number of hops required to reach a distant node would be decreased.

7. With regard to claim 2, Watts further discloses that the cross-links between the node clusters are selected at random (Col 1, ¶2).

8. With regard to claim 3, Annapareddy further discloses that the node clusters are fully interconnected (each node in a group connects to all others in the group) (Fig 2).

9. With regard to claims 4 and 5, while the system disclosed by Annapareddy in view of Watts shows substantial features of the claimed invention (discussed above), it fails to specifically disclose that the average path length between the nodes is less than 2.0, or, more specifically, between 1.5 and 1.7.

Watts teaches that adjusting parameters of a small-world network results in changes in the characteristic path length. Adding a few cross-links results in a large drop in the path length (Fig 2), while substantially maintaining the clustering of the network. It would have merely been a matter of preference to a designer of the system to adjust the parameters of the network to obtain any desired mean connectivity, such as one between 1.5 and 1.7.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust the number of cross links to obtain a mean connectivity of 1.5-1.7 or any mean connectivity desired by the designer of the system, based on the intended goal of the system.

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10. Claim 7 is rejected under the same rationale as claim 1, since they recite substantially identical subject matter. Any differences between the claims do not result in patentably distinct claims and all of the limitations are taught by the above cited art.

11. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Annapareddy et al. (US 5,602,839) in view of Watts et al. in further view of Brewer et al. (US 5,859,975).

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12. With regard to claim 6, while the system disclosed by Annapareddy in view of Watts shows substantial features of the claimed invention (discussed regarding claim 1), it fails to disclose that each node has a plurality of interconnected processors.

Brewer discloses that the use of multiple processors in a single node of a distributed system is well-known in the art (Col 1, Lines 26-31). The use of multiple processors in a single node allows that node to process more information than it would be capable with only a single processor.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a plurality of interconnected processors in each node since it would have allowed the nodes to process more information that they would be capable of processing with only a single processor.

Conclusion

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of


the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron Strange whose telephone number is 571-272-3959. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glen Burgess can be reached on 571-272-3949. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AS
8/7/06



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